

## **BACKGROUND OF THE INVENTION**

In a pallet rack system, it is common for the horizontal connecting structures that attach between upright left and right vertical posts, and/or upright columns, to contain a lip for retaining off-the-shelf commercial lumber boards to span between the front and rear horizontal connecting structures, such as that shown in U.S. patents 3,351,212 and 5,350,074. The commercial off-the-shelf lumber boards also referred to as “dimensional lumber” or “framing lumber,” span front to back of a pallet rack so that a pallet can be laid and slid across the boards without catching the edge of the boards. The ability to slide a pallet across the support surface would be impeded if the lumber were laid side by side parallel to the horizontal cross members and between the front and rear vertical posts. In a pallet rack system, no attempt is made in the previous art to place lumber boards lengthwise spanning left to right and parallel to the horizontal cross members, nor is there a need to have dimensional lumber to pass unimpeded between the front or rear vertical posts since the intent of the pallet rack construction defined by the previous art is for supporting pallet racks. A review of previous patents indicates the previous art was concerned with improving the structure, the means of attachment of the horizontal cross members, and the means of securing the horizontal cross members to the vertical post. This is presented in U.S. patents 3,351,212, 3,392,848; 3,414,224; 3,741,405; 4,074,812; 4,708,252; 5,025,937; 5,131,781; 5,713,476; 5,791,502; 5,938,367; 6,230,910; and 6,352,164.

Common to the prior art and applicable to placing lumber front to back, is the horizontal cross members. These structures are comprised of a formed steel beam containing a recessed lip for the lumber to span from the front to back of the rack structure, and two L-shaped flanges mounted perpendicular to the beam, typically by means of a weld. Metal protrusions equally spaced and located on the L-shaped flange, such as that of a metal rivet/lug, U.S. patent 3,351,212, or metal hook, U.S. patents 3,414,224, forms the means of attachment to the equally spaced apertures located on the front face of the vertical posts. Further shown in U.S. Patents 4,729,484 and 5,350,074, is that the horizontal supporting structures spanning left to right and

attaching to the vertical posts have the lumber support lip positioned to capture the lumber boards spanning front to back between the left and right vertical posts. As shown, either the L-shaped brackets attached on each end of the horizontal connecting structures prevent a board from passing unimpeded between the vertical uprights, or the vertical posts themselves present motion of the boards between the vertical posts. Preventing such motion is desirable in pallet rack construction used as a pallet rack, but for a workbench of pallet rack construction such a design is not desirable since the workbench surface cannot be continuous between the front and rear vertical posts. Furthermore, the previous pallet rack art provides no suitable means of securing the dimensional lumber that is laid from the front horizontal cross member to the back horizontal cross member.

The purpose of this invention is to create a workbench of pallet rack construction comprised of dimensional lumber laid side by side and parallel to the horizontal cross members. By setting the work surface front to back distance to allow an integral number of dimensional lumber pieces to lay side by side as the work surface along with improvements to the horizontal cross members, a rugged workbench table top comprised of dimensional lumber spanning parallel to the horizontal cross member and unimpeded between the vertical posts is obtained. An additional flange or lip positioned below the upper shelf lip on the horizontal cross members allows commercially available dimensional lumber to also function as a structural support member for the upper work surface created of dimensional lumber. Wood screw holes set in a pattern to acquire a particular dimensional lumber type and located on the horizontal cross member lower lip/flange provides suitable capture and minimizes wood splitting and warp. A right angle brace spanning from the front horizontal cross member to the back cross member and attaching to the horizontal cross member bracket wall prevents disengagement of the horizontal cross members from table top vibration and sets the dimensional lumber attachment height to the height of the horizontal cross member upper lip. Wood screw holes set in a pattern along the full

length on one side of the right angle brace captures a particular dimensional lumber type, thus minimizing wood splitting and warp.

## **BACKGROUND OF THE INVENTION - Version With Markings To Show Changes Made**

In a pallet rack system, it is common for the horizontal connecting structures that attach between upright left and right vertical posts, and/or upright columns, (upright column members) to contain a lip for retaining off-the-shelf commercial lumber boards to span between the front and rear horizontal connecting structures, such as that shown in U.S. patents 3,351,212 and 5,350,074. The commercial off-the-shelf lumber boards also referred to as “dimensional lumber” or “framing lumber,” span front to back of a pallet rack so that a pallet can be laid and slid across the boards without catching the edge of the boards. The ability to slide a pallet across the support surface would (not) be impeded (the case) if the lumber were laid side by side (horizontal) parallel to the horizontal cross members and (spanning) between the front and rear vertical posts. In a pallet rack system, no attempt is made in the previous art to place lumber boards lengthwise spanning left to right and parallel to the horizontal (to the) cross members, nor is there a need to have dimensional lumber to pass unimpeded between the front or rear vertical posts since the intent of the pallet rack construction defined by the previous art is for supporting pallet racks. A review of previous patents indicates the previous art was concerned with improving the structure, the means of attachment of the horizontal cross members, and the means of securing the horizontal cross members to the vertical post. This is presented in U.S. patents 3,351,212, 3,392,848; 3,414,224; 3,741,405; 4,074,812; 4,708,252; 5,025,937; 5,131,781; 5,713,476; 5,791,502; 5,938,367; 6,230,910; and 6,352,164.

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spaced apertures located on the front face of the vertical posts (upright column members). Further shown in U.S. Patents 4,729,484 and 5,350,074, is that the horizontal supporting structures spanning left to right and attaching to the vertical posts have the lumber support lip positioned to capture the lumber boards spanning front to back between the left and right vertical posts. As shown, either the L-shaped brackets attached on each end of the horizontal connecting structures prevent a board from passing unimpeded between the vertical uprights, or the vertical posts themselves present motion of the boards between the vertical posts. Preventing such motion is desirable in pallet rack construction used as a pallet rack, but for a workbench of pallet rack construction such a design is not desirable since the workbench surface cannot be continuous between the front and rear vertical posts. Furthermore, the previous pallet rack art provides no suitable means of securing the dimensional lumber that is laid from the front horizontal cross member to the back horizontal cross member.

The purpose of this invention is to create a workbench of pallet rack construction comprised of dimensional lumber laid side by side and parallel to the horizontal cross members. By setting the work surface front to back distance to allow an integral number of dimensional lumber pieces to lay side by side as the work surface along with improvements to the horizontal cross members, a rugged workbench table top comprised of dimensional lumber spanning parallel to the horizontal cross member and unimpeded between the vertical posts is obtained. An additional flange or lip positioned below the upper shelf lip on the horizontal cross members allows commercially available dimensional lumber to also function as a structural support member for the upper work surface created of dimensional lumber. Wood screw holes set in a pattern to acquire a particular dimensional lumber type and located on the horizontal cross member (upper and lower lips) lower lip/flange provides suitable capture and minimizes wood splitting and warp. A right angle brace spanning from the front horizontal cross member to the back cross member and attaching to the horizontal cross member bracket wall prevents disengagement of the horizontal cross members from table top vibration and sets the dimensional

lumber attachment height to the height of the horizontal cross member upper lip. Wood screw  
holes set in a pattern along the full length on one side of the right angle brace captures a particular  
dimensional lumber type, thus minimizing wood splitting and warp.

## **BRIEF SUMMARY OF INVENTION**

This invention presents a workbench of pallet rack construction comprising horizontal connecting structures, vertical posts and/or upright column members, and a workbench surface of one or more dry dimensional lumber boards, also called “framing lumber”, spanning parallel to the horizontal cross member and passing unimpeded between the front and back vertical posts. Improvements in the horizontal connecting structure help minimize work surface gaps while incorporating a second lip or flange below the upper lip to utilize a support brace for the upper dimensional lumber boards also of dimensional lumber and running lengthwise between the front and back cross members. The upper lip supports dry dimensional lumber that creates the tabletop surface and spans left to right and parallel to the horizontal cross members. The lower lip supports dry dimensional lumber, which provides cross bracing for the tabletop lumber and spans front to back and perpendicular to the upper surface. A right angle brace spanning front to back attaches to the front and rear horizontal cross member preventing the horizontal cross members from disengagement under table top vibration. The right angle brace containing a hole pattern of periodicity that captures the tabletop dry dimensional lumber and can be used in lieu of any other tabletop bracing.